

Model Interface and Data Storage Application (MIDSA) for IGSM2

- ☞ Interface Uses
- ☞ Elements of Interface
- ☞ Model Objects

Interface Uses

 Model Development

 Presentation

 Basin Management

 Alternatives Evaluation

Interface Uses

Model Development

↑ Build Model...

↑ Base Map and Model Extents

↑ Model Grid

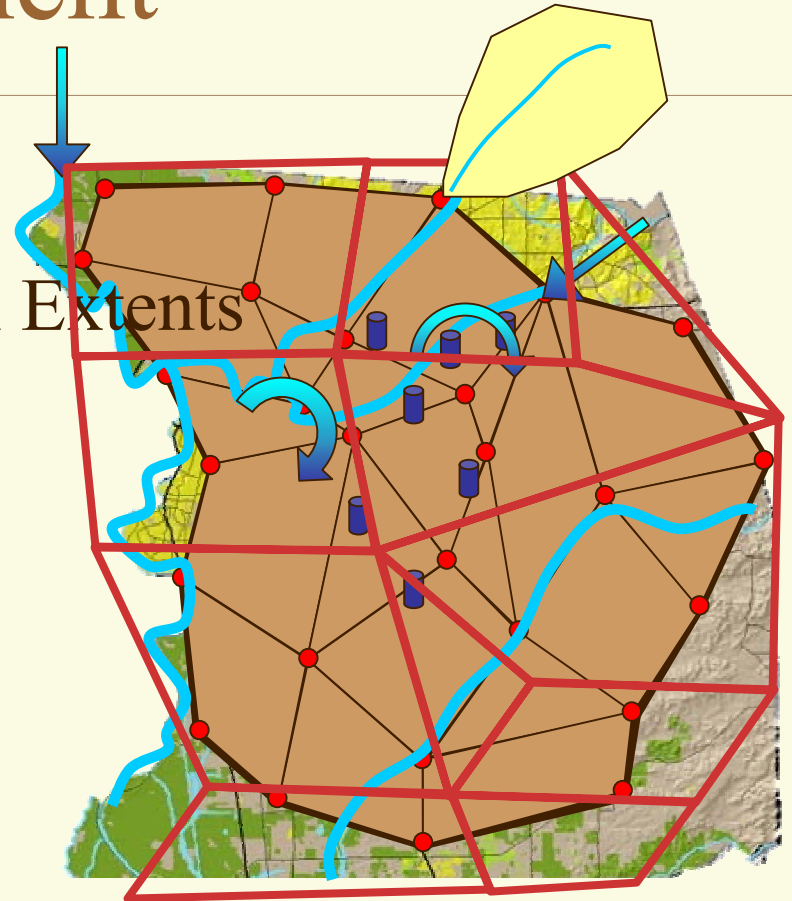
↑ Physical Features

↑ Parametric Grid

↑ Operations

↑ Boundary Conditions

↑ Calibration



Interface Uses

Presentation

↑ Graphically View Model Input and Output

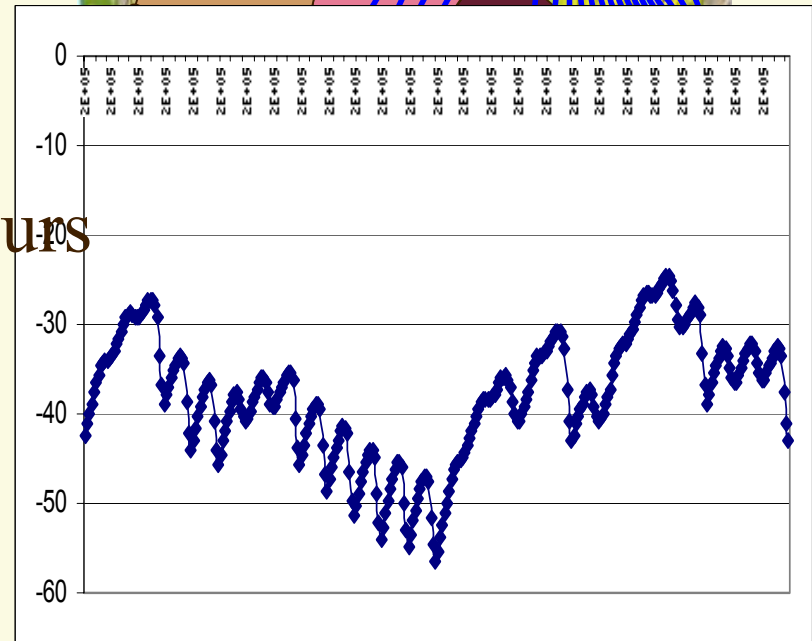
↑ Model Input Data

↑ Water Budgets

↑ Groundwater Contours

↑ Time Series Data

↑ Hardcopy

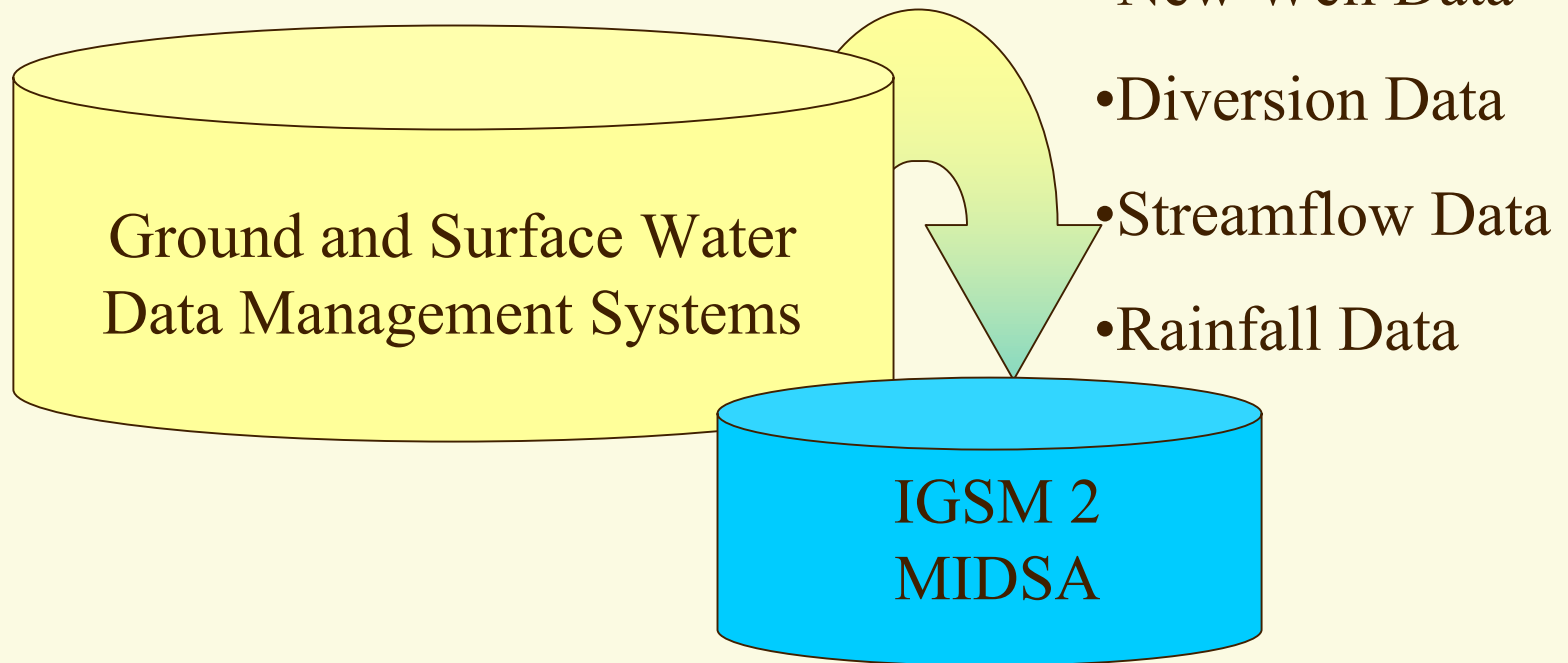


Interface Uses

Basin Management

↑ Data Sharing

↑ Active Connection with other Data Management Systems



Interface Uses

Alternatives Evaluation

- ↑ Track and Document Changes
- ↑ Undo Changes
- ↑ Mix Alternatives
- ↑ Alternative Comparisons

Elements of Interface

 Database

 Handling Flat File Data

 Tabular Presentation

 Track Changes

 Model Execution

 Graphical Engines

 Data Exchange Formats

Elements of Interface

Database

↓ Open Database Structure

↓ Standard Platform

↓ Example (Database Text File)

Elements of Interface

Handling of Flat File Data

- ↓ Open input file structure
- ↓ Script compiler for reading and writing model input files
- ↓ Example (template file and compiler)

Elements of Interface

Tabular Presentation

- ↓ Spreadsheet Functionality
- ↓ Built-in Processing Features
- ↓ Example (DMS Table Features)

Elements of Interface

Track Changes

↓ Track changes based on Alternatives

↓ View changes

↓ Undo changes

↓ Example (IGSM GUI Alternative Tracking)

Elements of Interface

Model Execution

- ↓ Control execution by creating subroutines to be called by interface

Graphical Engines

↓ Model Objects

↓ nodes, elements, streams, subregions, model

↓ Contouring

↓ Graphing

↓ Printing

Elements of Interface

Data Exchange Formats

↓ GIS Shape and *.dbf Files

↓ *.dxf

↓ Excel

↓ Access

↓ Comma Delimited

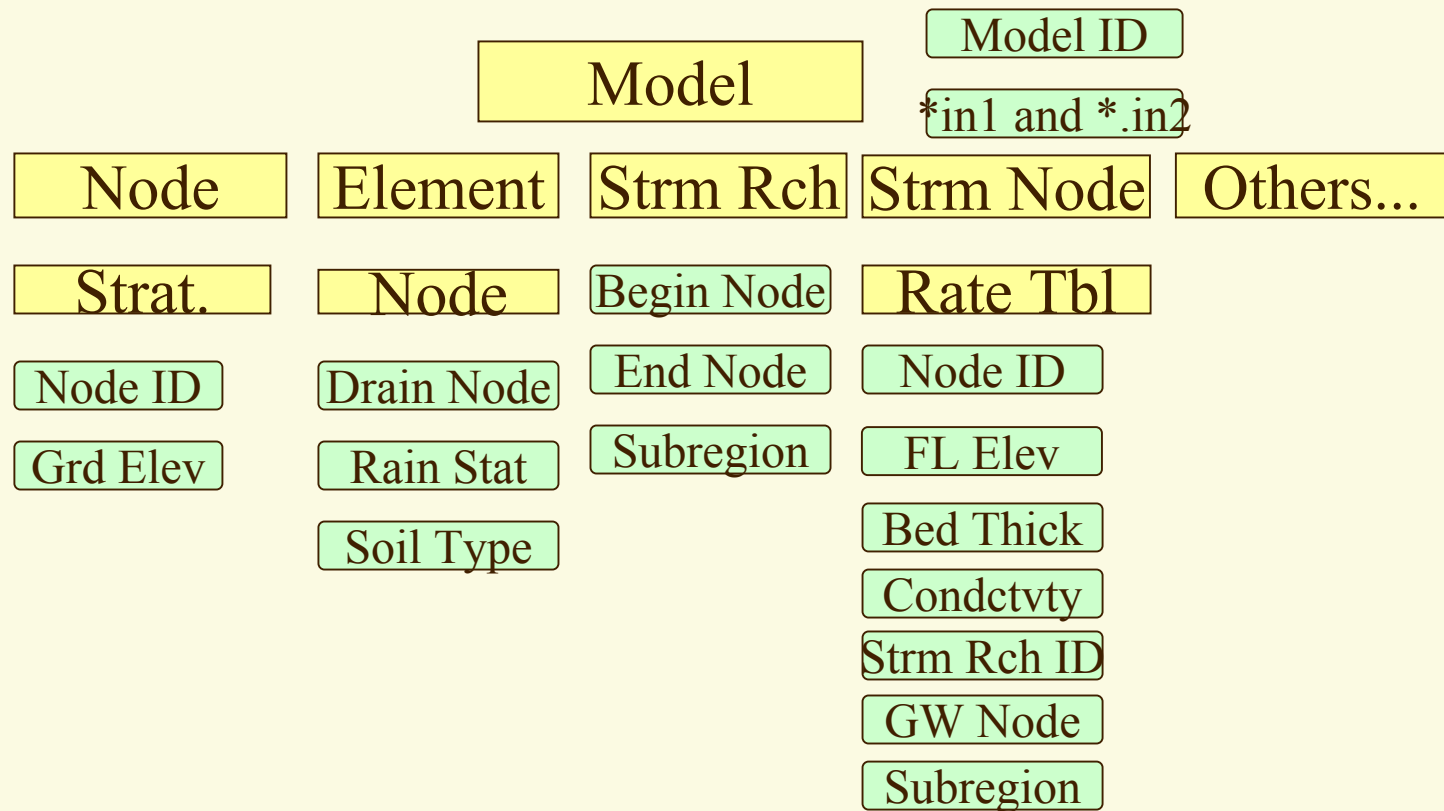
Model Objects

Model Objects contain:

- collections of other objects
- attribute properties
- graphical engines

Model Objects

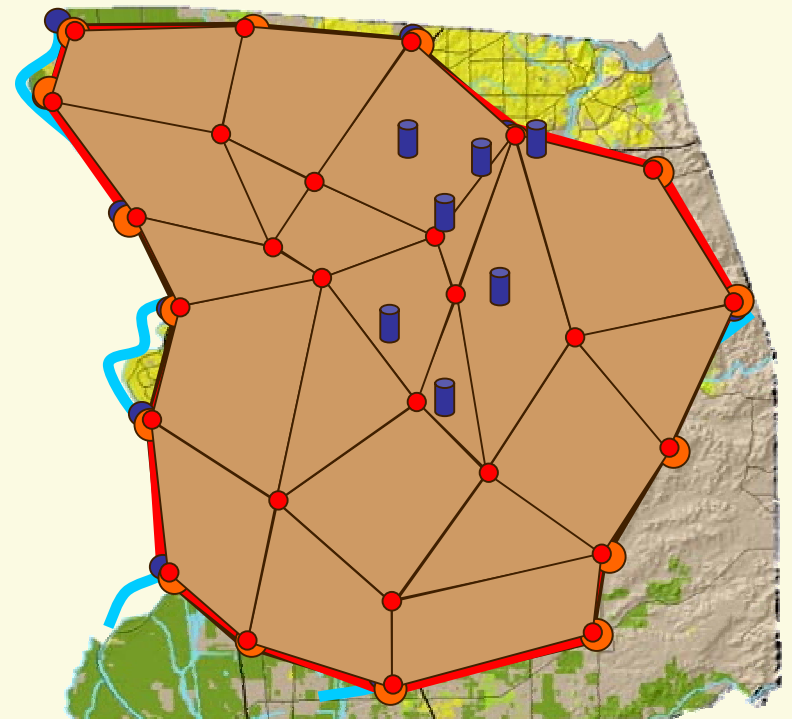
Object Data Structure



Model Objects

Object Graphics...

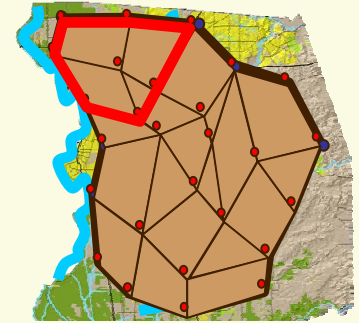
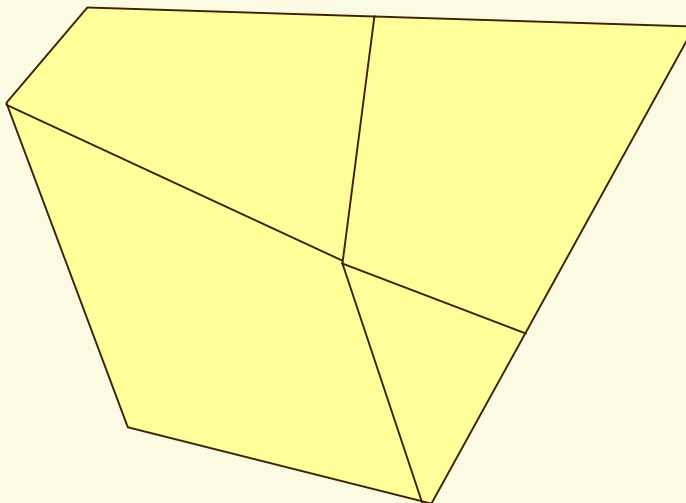
- Model
- Subregions
- Stream Nodes
- Boundary Nodes
- GW Nodes
- Elements
- Wells



Model Objects

Object Graphics...

↑ Subregion Object

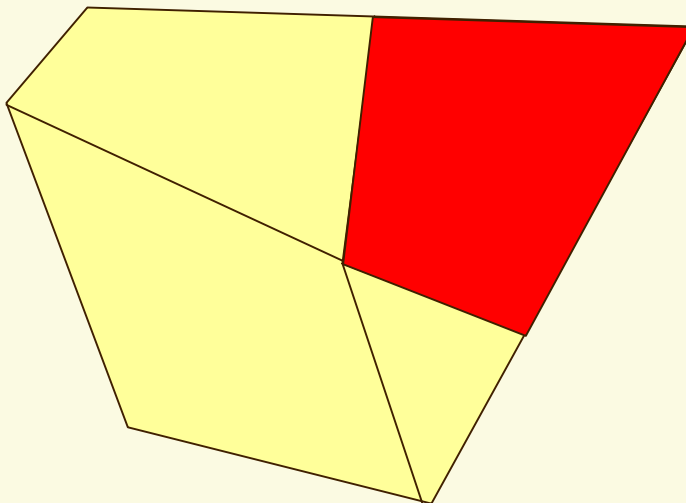
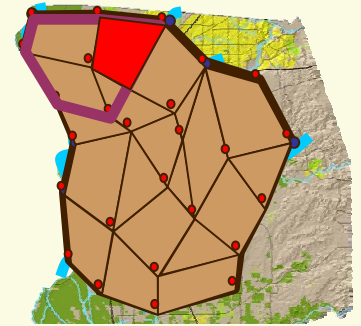


Name and Number
Soil Properties
Indoor/outdoor Usage
Return Flow Assignment
Urban Demand
Agricultural Supply Requirements
ET
Crop Efficiencies
Soil Moisture Requirements

Model Objects

Object Graphics...

↑ Element Object



Rainfall Station and Assignment
Drainage to Stream Node
Subregion and Subgroup
Assignment
Soil Type

Object Graphics...

↑ Well Example (DMS)

Upcoming IGSM Projects

↑ WESTSIM

↑ Sacramento

↑ Yuba

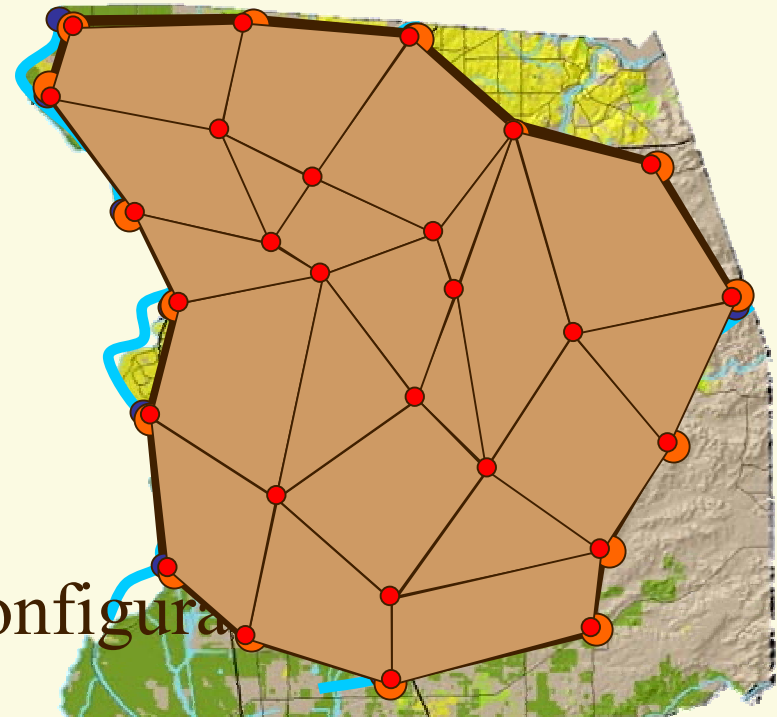
↑ others...

End

Desired Features

Creation of Model Grid

- ↑ Subregion Boundary
- ↑ Fixed Node Types
 - ↑ Stream
 - ↑ Model Boundary
 - ↑ Subregion
- ↑ General Node Type
- ↑ Fixed Node Linkage
- ↑ Automated Element Configuration



Desired Features

Model Stratigraphy

↑ Ground Surface

↑ Cross-sect Node Location with Ground Contours

↑ Aquifer Thickness

↑ Cross-sect Node Location with Aquifer Contours

Stream Geometry

- ↑ Stream Node to Groundwater Node Assignment
- ↑ Streamreach Definitions
 - ↑ Name
 - ↑ Number
- ↑ Subregion Assignment
- ↑ Flowline Elevations
- ↑ Stream Rating Curves
- ↑ Streambed Thickness

Assignment of Element Characteristics

- ↑ Rainfall Station and Assignment
- ↑ Drainage to Stream Node
- ↑ Subregion and Subgroup Assignment
- ↑ Soil Type

Subregion Definitions

- ↑ Name and Number
- ↑ Soil Properties
- ↑ Indoor/outdoor Usage
- ↑ Return Flow Assignment
- ↑ Urban Demand
- ↑ Agricultural Supply Requirements
 - ↑ ET
 - ↑ Crop Efficiencies
 - ↑ Soil Moisture Requirements

A silver metal spiral binding is visible on the left side of the page, looping through a series of holes.

Lake Geometry and Properties

Well Geometry

 Location


 Depth

 Screens

 Name

Creation of Model Parameters

 Parametric Grid and Node Configuration

 Assignment of Over-ride Groundwater Node

 Parametric Data

Stream Inflow

A spiral-bound notebook with a cream-colored page and a brown cover. The spiral binding is on the left side. The word "Rainfall" is written in a brown serif font at the top left of the page, underlined.

Rainfall

Pumping Sinks

 Land Use Assignment

 Well/Element Assignment

- Name and factors
- Time Series Data

Diversions and Import/Exports

 Name

 Specifications

 Recharge Elements

Boundary Conditions

 General Head

 Constant Head

 Time Series

 Tile Drains

Small Watershed

 Stream node assignment

 Properties

 Boundary Inflow

Presentation

 Print File

 Groundwater Head File

 Budget Files

Print File

Groundwater Hydrographs


- comparison with calibration well data

Stream Hydrographs

- comparison with actual streamflow data

Element Flux Hydrographs

Groundwater Head File

 Comparison with actual groundwater elevation contours

Budget Files

 Water Use

 Groundwater

 Stream

 Streamreach

 Soil Moisture

Model Run Parameters

 Pass 1

 Pass 2